

Remarks/Arguments

Claims 1-24 remain pending in the application. Reconsideration and reexamination are requested.

In the Office Action mailed June 21, 2006, the Examiner objected to the length of the Abstract. An amended (less than 150 words) abstract is provided in the amendments to the specification of this paper.

The Examiner also objected to the specification, as section heads were missing. Appropriate corrections are made in the Amendments to the Specification portion of this paper.

Regarding the claims, the Examiner objected to claims 1-22 as the independent claims did not start with "A" and the dependent claims did not begin with "The". Appropriate changes have been made to claims 1-24. Accordingly, no new matter has been entered.

Turning to the rejections, the Examiner first rejected claims 1-24 under 35 U.S.C. 112, first paragraph as being indefinite, being generally narrative and not conforming to U.S. practice.

The claims have been amended herein to more particularly point out and distinctly claim the subject matter which the applicants regard as the invention. In addition, independent claim 1 has been amended to include the matter of claims 8, 12 and 13. New claims 25 and 26 have been added, directed at other embodiments of the invention. Support may be found at page 11, lines 22-25 and at page 5, lines 15-31. Accordingly, no new matter has been entered. Claims 8, 12 and 13 have been canceled.

The Examiner has rejected claims 1, 2, 4, 5, 7, 11-19, 23 and 24 under 35 U.S.C. 102(b) as being anticipated by Reiners (USP 3,104,594). This patent appears to be directed at a resilient ring mounted in an upper ring insert of a piston and capable of engaging a cylinder wall in an engine. The ring expands during operation of the engine and may twist to prevent gas leakage and encourage heat dissipation by sealing along one face.

As the Examiner may recognize, Reiners teaches the uses of multiple grooves and rings. As the Examiner may then have noticed, claim 1 has been amended to recite that that the subject sealing arrangement consists essentially of a sealing ring having the

indicated features. That being the case, it is believed that claim 1 no longer can be read on the prior art of Reiners, who instructs on the use of multiple sealing rings. See, e.g., Fig. 1, of Reiners, which shows sealing ring locations (grooves) 17, 18, and 19 and column 2 lines 45-47.

Independent claim 1 has also been amended to recite that such a sealing ring is divided almost completely or throughout in the radial direction at one point on its circumference, forming a weaker area. This is not taught or suggested by Reiners. As noted above, this was the matter of original claim 8 and is described more fully at page 20, lines 7-24 of the specification and in **FIGS. 6a-6f**.

Dependent claims 2, 4, 5, 7, 11-19, 23 and 24 depend directly or indirectly from amended claim 1 and are similarly distinguished over the cited art of Reiners.

Dependent claims 3 and 6 were rejected under 35 U.S.C. 103(a) as being unpatentable over Reiners. Since dependent claims 3 and 6 depend directly or indirectly from amended claim 1, they are believed to be similarly distinguished over the cited art of Reiners.

Dependent claims 8 and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over Reiners in view of Bingham et al. (USP 6,305,265). Reiners has been discussed above. Bingham et al. also appears to be directed at a sleeve seal assembly mounted between a pump body and a piston, wherein the assembly comprises a plurality of ring-shaped members. Applicants recognize that in the Office Action of June 21, 2006, Reiners was combined with Bingham for the proposition that it would have been obvious to divide the seal. However, Bingham, similar to Reiners, teaches that one should utilize a “plurality of ring shaped seal members **44**”, which is illustrated in **FIG. 2**. See also, column 3, line 67 to column 4, line 2 of Bingham.

Dependent claim 10 was rejected under 35 U.S.C. 103(a) as being unpatentable over Reiners in view of Gripe et al. (USP 3,936,444). Reiners has been discussed above. Gripe et al. appears to be directed at a soft compressible O-ring for mounting in a ring groove. Amended claim 1 recites that the sealing ring is divided almost completely or throughout in the radial direction at one point on its circumference, forming a weaker area, and that the entire sealing surface is in sealing contact with one of said two components to form a seal when the sealing ring is pressurized. This is not taught or

suggested in Gripe et al. An O-ring comprises an annular body secured concentrically in a groove to seal. If the O-ring is divided, or not a continuous member, it would likely not be retained in a groove due to its flexible nature. In addition, the sealing portion of the O-ring of Gripe et al. does not have the entire sealing area in sealing contact with one of the components, as the sealing surfaces **22** and **28** are not flat and are not capable of sealing over their entire sealing surfaces. Thus, Gripe et al. does not make up for the deficiencies of Reiners.

Dependent claims 20 -22 were rejected under 35 U.S.C. 103(a) as being unpatentable over Reiners in view of Wheeler (USP 4,336,946). Wheeler appears to be directed at a non-rotatable elastomeric O-ring for sealing between a housing and a shaft. This reference suffers from the same deficiencies as Gripe et al. relative to amended claim1 and further does not make up for the deficiencies of Reiners.

Given the distinctions between the present invention and the cited art it is believed that the rejections of claims 1-24 under 35 U.S.C. 102(e) and 103(a) have been overcome.

With regards to new claims 25-26, it is worth noting that said claims recite features that are not believed to be present in the art of record. For example, claim 25 recites that the pressurizing surface (see, e.g., item **8** in **FIG. 1a**) and the supporting surface (see, e.g. item 7 in **FIG. 1a**) are inclined relative to the sealing surface (see item 2 in **FIG. 1a**) and enclose an angle of about 30 – 60 degrees. See again, page 4, line 36 to page 5, line 5 of the specification. Such feature is not disclosed in Reiners as similarly pointed out in the Office Action of June 21, 2006 at page 8. Applicants note that the Examiner commented that in spite of this deficiency, it would have been obvious to make the surfaces at an angle of 30 degrees to 60 degrees on the grounds that where the general conditions of a claim are disclosed in the prior art, the optimum or workable ranges only involve routine skill in the art.

Applicants respectfully disagree that the above analysis may apply to Reiners and the specifics of providing a seal with a pressurizing surface and supporting surface inclined relative to a sealing surface to enclose an angle of about 30 – 60 degrees. Critical examination of Reiners (**FIG. 2**), and as best could be determined, teaches that the angle may be no greater than about 15 degrees. No other guidance is supplied as to

any benefit to vary such angle to provide any stated benefit. Applicants therefore respectfully submit that claim 25 therefore defines over the art of record. Accordingly, no new matter has been entered.

Claim 26 recites that the groove is of a concave rounded design in the central area of the groove base and in both transitional areas to both adjacent groove flanks, with a continuous transition of the concave groove base to the groove flanks. See e.g., item 31 in Fig. 3b which illustrates a rounded design. The supporting surface and pressurizing surface are also said to each follow on from the sealing surface from a concavely curved, arc-shaped transitional area. See, page 5, line 20-22. Accordingly, as noted above, no new matter has been entered and such feature is also believed not be disclosed in the art of record.

In the event the Examiner deems personal contact is necessary, please contact the undersigned attorney at (603) 668-6560.

Respectfully submitted,

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By / April Davis /
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